

SHORT COMMUNICATIONS

Success Rates of the Peregrine Falcon (*Falco peregrinus*)
Hunting Dunlin (*Calidris alpina*) During Winter

Joseph B. Buchanan, Steven G. Herman and Tod M. Johnson

The Peregrine Falcon (*Falco peregrinus*) utilizes a wide variety of prey types (Ratcliffe 1979; Cade 1982) throughout its nearly cosmopolitan distribution. In addition, it also exhibits a huge range (7-83%) of success rates for hunting flights (see Roalkvam 1985 for review). Success rates of hunting flights during winter periods have been reported by Lindberg (1975), Clunie (1976) and Roalkvam (1985); however, data on success rates for specific prey species or prey type are lacking. Here we present data for rates of success when Peregrines hunted Dunlin (*Calidris alpina*) during the winter (December-March).

During the winters of 1979-1981, while studying the ecology of the Dunlin in western Washington, we observed hunting flights directed at this species by peregrines. Hunting flights were observed at the Samish River Delta, in northern Puget Sound, and at Bowerman Basin and 2 other estuarine sites located in Grays Harbor on the outer coast. Subadult and adult male and female Peregrines of 2 subspecies, *F. p. pealei* and *F. p. anatum*, were observed hunting Dunlins. A description of behavioral interactions between Dunlins and their falcon predators [Peregrines and Merlins (*F. columbarius*)] will be presented elsewhere.

We define a hunting flight as a perch-to-perch flight involving one or more capture attempts at suitable prey. A capture attempt is defined as an individual effort to capture a specific individual during a hunting flight.

We observed 17 hunting flights directed at Dunlins, 15 of which had known outcomes. Peregrines were successful at capturing Dunlins from a stoop and when pursuing indi-

viduals in a low direct chase. Stoops were used in 11 (65%) hunting flights. In 2 flights these were high stoops, originating from heights of 1000 m or more. Other stoops originated from 50-80 m. Feint stoops were observed only twice. Of 47 capture attempts, 33 (70%) were stoops at flocks, 6 (13%) were low chases of single Dunlins and 8 (17%) were horizontal attacks of flocks.

The success rate for hunting flights was 47% (n=7) while the rate for capture attempts was 14.6%. Five flights (33%) were successful on the first capture attempt. A stoop was used in 3 of these hunts, and low chase after a single Dunlin in the other 2. Seventy-one percent of the successful hunts were successful on the first capture attempt. All but one successful hunt involved in-flight prey capture.

The success rate (47%) which we observed was significantly greater than the winter rate of 9.6% reported by Clunie (1976) ($\chi^2 = 7.9$, $df = 1$; $0.001 < P < 0.005$) or the 13.7% reported by both Lindberg (1975) and Roalkvam (1985) ($\chi^2 = 11.6$; $df = 2$; $0.001 < P < 0.005$). Dekker (1980) presents data for success rates in regard to fall hunting flights directed at shorebirds (9.0%), although his data obviously refer to migrant falcons.

The high success rate of hunting flights which we observed, relative to these studies, might be explained in two ways. First, if a falcon is unfamiliar with a site that it seldom visits (e.g., during migration) success rates for hunting flights might be expected to be lower than for falcons which maintain winter territories. Secondly, the high success rate we observed was related to the success rate of the initial capture attempt, which at 71% for suc-

cessful hunts means that few falcons continued to hunt after the first attempt. This is not surprising since a certain trade-off must exist between reasonable energy expenditure and profitable caloric intake.

Cade (1982) states that Peregrines will not stoop into a massed flock of birds. We found, however, that a stoop into a compact flock was the most common technique used by Peregrines hunting Dunlins in western Washington. The rarity of the high stoop may be related to the apparent ease with which Peregrines capture Dunlins using other techniques. Also, such an effort may be energetically inefficient considering the probable low caloric value of a small species such as the Dunlin.

ACKNOWLEDGMENTS

We thank L. A. Brennan, A. M. Cahall, M. A. Finger, and C. T. Schick for their assistance in the field. C. M. Anderson contributed in many ways and provided valuable discussion on the topic of definitions for hunting flights and capture attempts. Funding during the winter of 1980-81 was provided by NSF-SOS Grant SPI80-04760. The manuscript was improved by comments from D. A. Boyce, S. K. Sherrod and C. M. White.

LITERATURE CITED

- CADE, T.J. 1982. *The Falcons of the World*. Cornell University Press, Ithaca, New York.
- CLUNIE, F. 1976. A Fiji Peregrine (*Falco peregrinus*) in an urban-maritime environment. *Notornis* 23:8-28.
- DEKKER, D. 1980. Hunting success rates, foraging habits, and prey selection of Peregrine Falcons migrating through central Alberta. *Can. Field-Nat.* 94: 371-382.
- LINDBERG, P. 1975. *Pilgrimsfalken i Sverige*. Svenska Naturskyddsforeningen. Stockholm, Sweden.
- RATCLIFFE, D. 1980. *The Peregrine Falcon*. Buteo Books. Vermillion, South Dakota.
- ROALKVAM, R. 1985. How effective are hunting Peregrines? *Raptor Res.* 19:27-29.
- 1409 W. 7th Avenue, Olympia, Washington 98501. Address of second author: The Evergreen State College, Olympia, Washington 98505. Address of third author: 12508 S.E. 49th Avenue, Bellevue, Washington 98806.

Received 7 April 1986; Accepted 25 July 1986.

Golden Eagle Capture of an American Coot

Daniel J. Severson

Previous food habit studies of the Golden Eagle (*Aquila chrysaetos*) list the American Coot (*Fulica americana*) as a prey item (Dixon, *Condor* 39:49-56, 1937; Olendorff, *Am. Midl. Nat.* 95:231-236, 1976; Bloom and Hawks, *Raptor Res.* 16:110-115, 1982; Marr and Knight, *Murrelet* 64:73-77, 1983). Dixon (1937) reported several observations of Golden Eagles capturing coots. The eagle positioned itself between the lake and the coots, using natural barriers to conceal its approach, and then quickly attacked its prey. Dixon believed that this was a learned method that was often used.

On 14 April 1982 at ca 0900 H near Malheur Lake in southeastern Oregon, accompanied by M. Rule, I observed an estimated 500 coots feeding in a partially flooded alfalfa field bordering Malheur Lake. I also observed a Golden Eagle flying directly toward the coots at a height of 20 m. The coots began running toward the lake when the eagle was within ca 200 m. The eagle flew over the coots, turned into the wind and briefly hovered, holding its position as they passed underneath. The eagle made 2 unsuccessful dives at the coots before capturing one on the